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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/501,502	07/15/2004	Akira Tsuruta	0020-5278PUS1	8267

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EXAMINER

SAINT CYR, LEONARD

ART UNIT	PAPER NUMBER
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2626

NOTIFICATION DATE	DELIVERY MODE
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02/04/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/501,502	Applicant(s) TSURUTA, AKIRA	
	Examiner Leonard Saint-Cyr	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 11/15/07 have been fully considered but they are not persuasive.

Applicant argues that Stevens et al., do not disclose a context dependent acoustic model storage unit storing context dependent acoustic models in a form of sub-word state trees (Amendment, pages 5, and 6).

The examiner disagrees, Stevens et al., teach that the acoustic models represent phonemes, wherein each phoneme may be represented as a triphone that includes multiple nodes, and a triphone is a context-dependent phoneme (paragraph 78, lines 1, and 2; paragraph 75, lines 4 – 6). By representing acoustic models by phonemes, wherein each phoneme may be represented as a triphone that includes multiple nodes implies using a context dependent acoustic model storage unit storing context dependent acoustic models in a form of sub-word state trees, since each phoneme of the acoustic models contain multiple nodes that represent a tree structure.

Applicant argues that Stevens et al., do not teach performing matching between feature parameters of inputted speech and the developed hypotheses so as to output word information including a word, an accumulated score, and a beginning start frame with respect to a hypothesis representing a word end portion (Amendment, pages 7, and 8).

The examiner disagrees, Stevens et al., teach a recognizer receives and processes the frames of an utterance to identify text corresponding to the utterance. The recognizer entertains several hypotheses about the text and associates a score with each hypothesis. The recognizer determines that a word is ending when the frame corresponds to the last component of the model for the word. If the recognizer determines that a word is ending, the recognizer sets a flag that indicates that the next frame may correspond to the beginning of a word (paragraph 60, lines 1 - 4; paragraph 93, lines 4 - 9). Processing the frames of an utterance to identify text corresponding to the utterance based on several hypotheses about the text and associates a score with each hypothesis implies performing matching between feature parameters of inputted speech and the developed hypotheses so as to output word information including a word, an accumulated score, and a beginning start frame with respect to a hypothesis representing a word end portion, since the recognizer can indicate whether or not a frame represents a beginning of a word.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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3. Claims 1, 4 – 6, and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Stevens et al., (US PAP 2002/0138265).

As per claims 1, 6 - 8, Stevens et al., teach a continuous speech recognition apparatus and method which uses, as a recognition unit, a sub-word determined depending on an adjacent sub-word and which uses context dependent acoustic models dependent on sub-word context to recognize a continuous input speech, comprising:

a word lexicon in which each of words included in vocabulary is stored in a form of a sub-word network or in a sub-word tree structure ("lexicon tree"; paragraph 90);

a language model storage unit in which language models representing information regarding connection between words is stored (vocabulary files contain all of the words, and language model information"; paragraph 76);

a context dependent acoustic model storage unit in which the context dependent acoustic models are stored in a form of sub-word state trees in each of which state sequences of a plurality of sub-word models of the context dependent acoustic models are organized in a tree structure ("each phoneme may be represented as a triphone that includes multiple nodes. A triphone is a context-dependent phoneme"; paragraph 75);

a matching unit developing hypotheses of sub-words by referencing the sub-word state tree representing the context dependent acoustic models, the word lexicon and the language models, and performing matching between the feature parameters of inputted speech and the developed hypotheses so as to output ("the score reflects the probability that a hypothesis corresponds to the user's speech"), word information

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including a word, an accumulated score and a beginning start frame with respect to a hypothesis representing a word end portion (“a sequence of phonemes for which the matches were sought was the actual sequence of phonemes produced by the speaker”; paragraphs 60, and 169);

and a search unit for searching the word information to generate recognition results (paragraphs 22, and 105).

As per claim 4, Stevens et al., further disclose that when developing the hypotheses by referencing the sub-word state tree, the matching unit puts a flag on states connectable to each other in the sub-word state trees that represent the hypotheses, by using information on connectable sub-words obtained from the word lexicon and the language model (“sets a flag”; paragraph 93).

As per claim 5, Stevens et al., further disclose that during a matching operation, the matching unit calculates scores of the developed hypotheses based on the feature parameters (“the score reflects the probability that a hypothesis corresponds to the user’s speech”), and prunes the hypotheses in conformity to criteria including a threshold value of the scores or a quantity of hypotheses (Hypothesis could have been pruned”; paragraph 60, lines 1 – 6; paragraph 195, lines 13 - 15).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stevens et al., (US PAP 2002/0138265) in view of Chen et al., (US Patent 6,006,186).

As per claim 2, Stevens et al., further disclose that context dependent acoustic models stored in the context dependent acoustic model storage unit are context dependent acoustic models in which a center sub-word depends on sub-words preceding and succeeding the center sub-word respectively ("the triphone "abc" represents the phoneme "b" in the context of the phonemes "a" and "c"; paragraph 75).

However Stevens et al., do not specifically teach the state sequences of sub-word models having identical preceding sub-words and identical center sub-words are organized in a tree structure.

Chen et al., teach that a shared phoneme model is generated to represent each of the groups of triphone phoneme models for which the number of trained frames available in the training library having common biphone, wherein the common biphone may comprise either the center context in combination with either right or left context of the triphone model (col.10, lines 24 – 32).

Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a common biphone as taught by Chen et al., in Stevens

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et al, because that would make the system more efficiency, by retrieving faster the spoken words.

As per claim 3, Chen et al., further disclose that the context dependent acoustic models are state sharing models in which a plurality of sub-word models share states ("shared phoneme models"; col.10, lines 24 – 32).

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonard Saint-Cyr whose telephone number is (571) 272-4247. The examiner can normally be reached on Mon- Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

LS
01/23/08


RICHEMOND DORVIL
SUPERVISORY PATENT EXAMINER